

202201UECM3473OE1a

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Review of preview

Started on	Friday, 28 January 2022, 10:41 AM
Completed on	Friday, 28 January 2022, 10:42 AM
Time taken	5 secs
Grade	0 out of a maximum of 10 (0%)

1

Marks: 1

Let X and Y have joint probability density function(pdf) $f(x,y) = ce^{-5y}$, $0 < x < y < \infty$ and zero otherwise. Find the mean of the conditional distribution of Y|X=2.2. ____

Answer:

✗

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Incorrect

Correct answer: 2.4

Marks for this submission: 0/1.

2

Marks: 1

Let X_1 and X_2 be independent random variables. X_1 follows a gamma distribution with parameters $\alpha = 6$ and $\beta = 1/9$, whereas X_2 follows an exponential distribution with mean $1/6$. Find $E[X_1|X_1 + X_2 = 3]$. ____

Answer:

✗

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Incorrect

Correct answer: 1.79399

Marks for this submission: 0/1.

3

Marks: 1

You are given the followings:

A portfolio of risks consists of 2 classes, A and B. For an individual risk in either class, the number of claims has the following distribution.

Class	Number of Exposure	Distribution of Claim Frequency	
		Mean	S. Deviation
A	500	0.05	0.283
B	500	0.2	0.659
Total Portfolio	1,000		

Determine the standard deviation of the claim frequency for the total portfolio. ____

Answer:

✗

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Incorrect

Correct answer: 0.5126

Marks for this submission: 0/1.

4

Marks: 1

Given a value of $(\Theta = \theta)$, the random variable X follows a Gamma distribution with probability density function

$$f(x) = \theta^2 x e^{-\theta x}.$$

Θ has a uniform distribution on the interval $(1, 10)$. Determine $S_X(0.55)$ for the unconditional distribution. _____

Answer:

✗

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Incorrect

Correct answer: 0.291024

Marks for this submission: 0/1.

5

Marks: 1

Annual claim counts per risk are binomial with parameter $m = 3$ and Q . Q varies by risk uniformly on $(0.34, 0.84)$. For a risk selected at random, determine the probability of at most one claims. _____

Answer:

✗

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Incorrect

Correct answer: 0.37771

Marks for this submission: 0/1.

6

Marks: 1

You are given:

- Conditional on λ , the random variables X_1, X_2, \dots, X_m , are independent and follow a Poisson distribution with parameter λ .
- $S_m = X_1 + X_2 + \dots + X_m$.
- The distribution of Λ is Gamma with parameters $\alpha = 7$ and $\theta = 19$.

Determine the variance of the marginal distribution of S_{113} . _____

Answer:

✗

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Incorrect

Correct answer: 32282292

Marks for this submission: 0/1.

7

Marks: 1

The size of loss X has mean 5λ and variance $9\lambda^2$. Λ has the following density function:

$$f(\lambda) = 6(1270)^6 / (\lambda + 1270)^7.$$

Calculate the variance of the loss. _____

Answer:

✗

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Incorrect

Correct answer: 3870960

Marks for this submission: 0/1.

8

Marks: 1

The annual number of accidents for an individual driver has a Poisson distribution with mean λ . The mean, Λ , of a heterogeneous population of drivers have a gamma distribution with mean 0.66 and variance 0.1452. Calculate the probability that a driver selected at random from the population will have 2 or more accidents in one year. _____

Answer:

✗

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Incorrect

Correct answer: 0.1514

Marks for this submission: 0/1.

9

Marks: 1

% The random variable X follows a distribution with mean $E[X] = b/(a-1)$ and variance $V[X] = (ab^2)/[(a-1)^2(a-2)]$, where $a = 4$ and $b = 6$ are the parameters of the distribution.

Y is a random variable such that $E(Y|X = x) = 6x + 6$ and $V(Y|X = x) = x^2 + 5$.

Calculate the unconditional standard deviation of Y . _____

Answer:

✗

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Incorrect

Correct answer: 17.4642

Marks for this submission: 0/1.

10

Marks: 1

Let X be an exponential random variable with mean $1/8.7$. Determine $E(X|X < 2.2)$. _____

Answer:

✗

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Incorrect

Correct answer: 0.114943

Marks for this submission: 0/1.

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